

TOSHIBA Photocoupler Photo Relay

TLP296G

Telecommunication

Data Acquisition

Measurement Instrumentation

The TOSHIBA TLP296G consists of gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a 8 lead DIP package (DIP8).

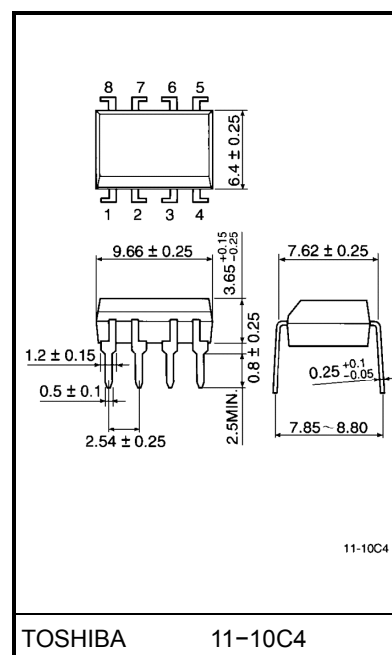
The TLP296G is a bi-directional switch which can replace mechanical relay in many applications.

- 8 pin DIP (DIP8), 2 channel type (2-form-A)
- Peak off-state voltage: 400 V (min.)
- Trigger LED current: 5 mA (max.)
- On-state current: 100 mA (max.)
- On-state resistance: 30 Ω (max.)
- Isolation voltage: 2500 V_{rms} (min.)
- Trigger LED current (T_a = 25°C)

Classification	Trigger LED Current (mA)		Marking Of Classification
	@I _{ON} = 100 mA		
	Min.	Max.	
(IFT2)	—	2	T2
Standard	—	5	T2, blank

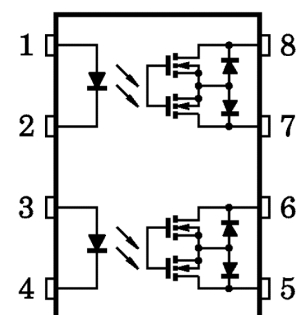
(*): Ex. Rank IFT2: TLP296G (IFT2)

Unit in mm



Weight: 0.54 g

Pin Configuration (top view)



- 1, 3 : ANODE
- 2, 4 : CATHODE
- 5 : DRAIN D1
- 6 : DRAIN D2
- 7 : DRAIN D3
- 8 : DRAIN D4

Maximum Ratings (Ta = 25°C)

Characteristic			Symbol	Rating	Unit
LED	Forward current		I _F	50	mA
	Forward current derating (Ta ≥ 25°C)		ΔI _F / °C	−0.5	mA / °C
	Peak forward current (100 μs pulse, 100 pps)		I _{FP}	1	A
	Reverse voltage		V _R	5	V
	Junction temperature		T _j	125	°C
Detector	Off-state output terminal voltage		V _{OFF}	400	V
	On-state current	Both channel Note 1	I _{ON}	100	mA
		One channel		120	
	On-state current derating (Ta ≥ 25°C)	Both channel Note 1	ΔI _{ON} / °C	−1.0	mA / °C
		One channel		−1.2	
	Junction temperature		T _j	125	°C
Storage temperature range			T _{stg}	−55~125	°C
Operating temperature range			T _{opr}	−20~85	°C
Lead soldering temperature (10 s)			T _{sol}	260	°C
Isolation voltage (AC, 1 min., R.H.≤ 60%) Note 2			BV _S	2500	V _{rms}

(Note 1): Two channels operating simultaneously.

(Note 2): Device considered a two-terminal device: Pins 1, 2, 3 and 4 shorted together and pins 5, 6, 7 and 8 shorted together.

Recommended Operating Conditions

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{DD}	—	—	320	V
Forward current	I_F	7.5	15	25	mA
On-state current	I_{ON}	—	—	100	mA
Operating temperature	T_{opr}	-20	—	80	°C

Individual Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	$I_F = 10 \text{ mA}$	1.0	1.15	1.3	V
	Reverse current	I_R	$V_R = 5 \text{ V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Off-state current	I_{OFF}	$V_{OFF} = 400 \text{ V}$	—	—	1	μA
	Capacitance	C_{OFF}	$V = 0, f = 1 \text{ MHz}$	—	—	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	I_{FT}	$I_{ON} = 100 \text{ mA}$	—	2	5	mA
On-state resistance	R_{ON}	$I_{ON} = 100 \text{ mA}, I_F = 10 \text{ mA}$	—	20	30	Ω

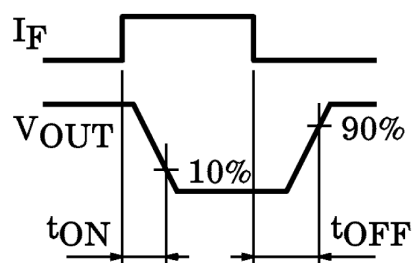
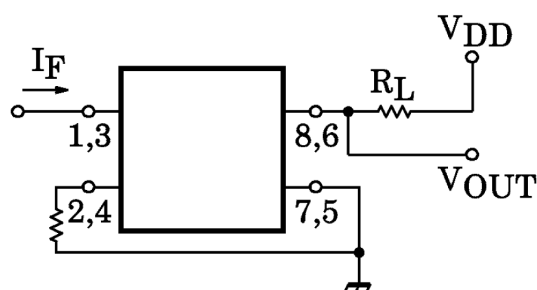
Isolation Characteristics (Ta = 25°C)

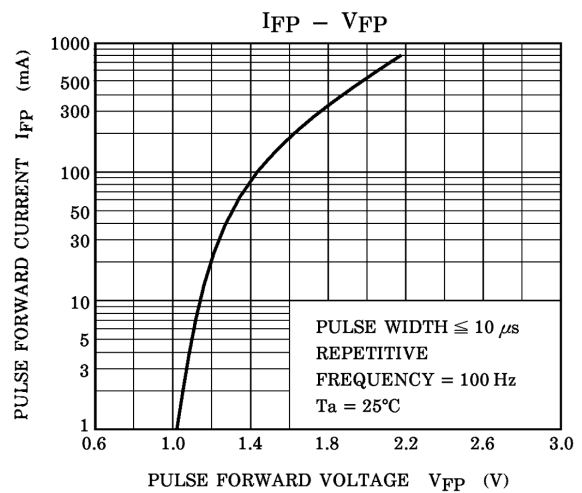
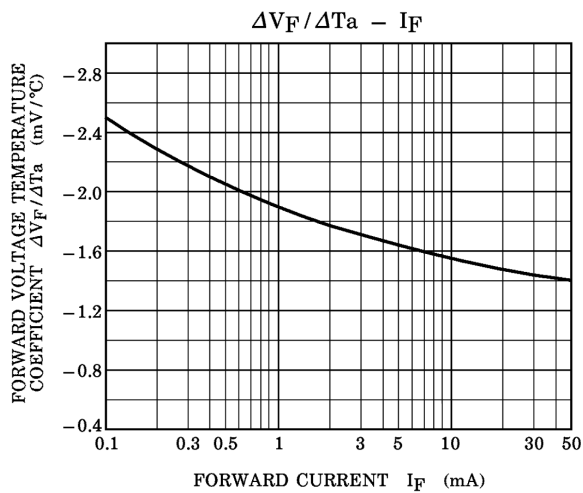
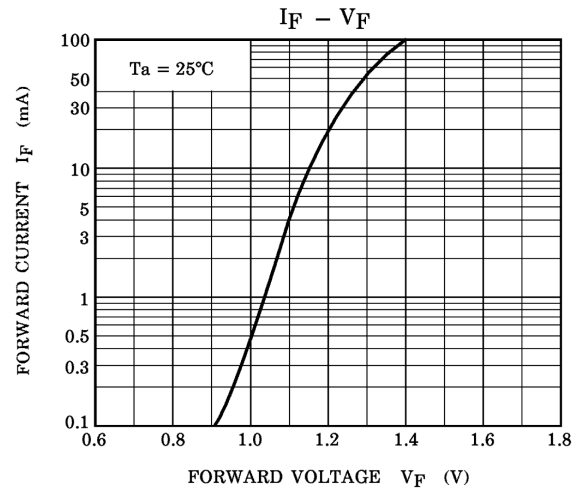
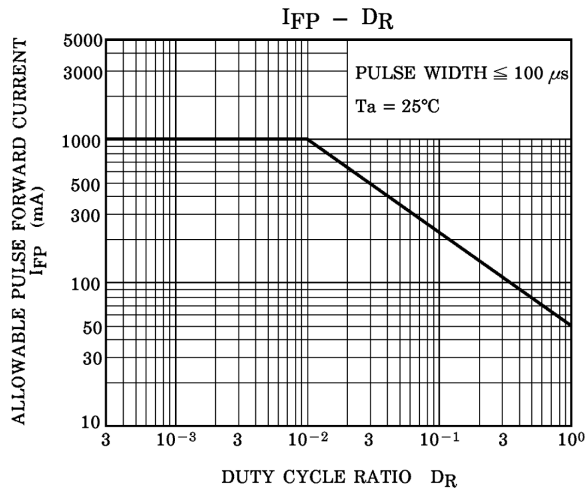
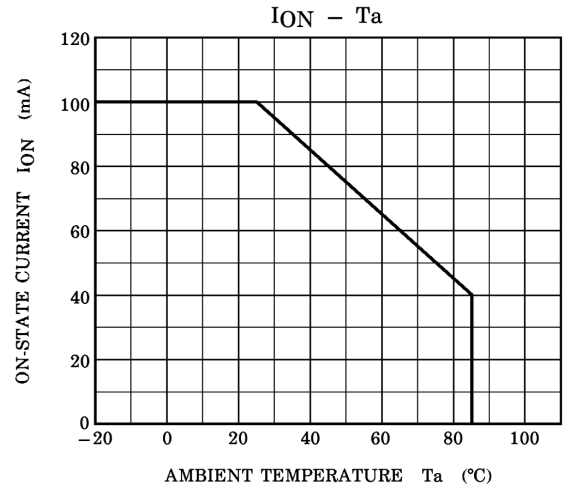
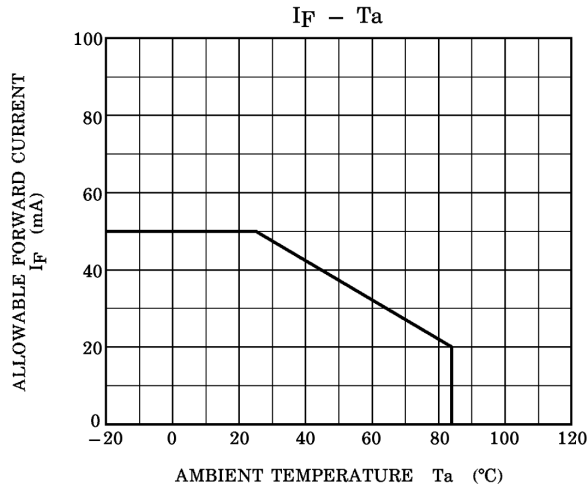
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	2500	—	—	V_{rms}
		AC, 1 second (in oil)	—	5000	—	
		DC, 1 minute (in oil)	—	5000	—	Vdc

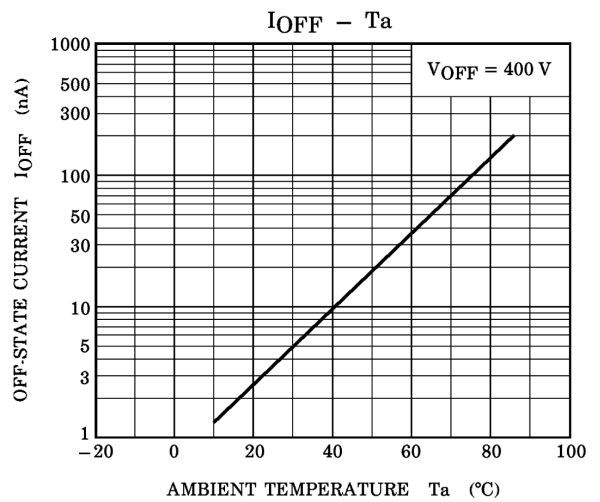
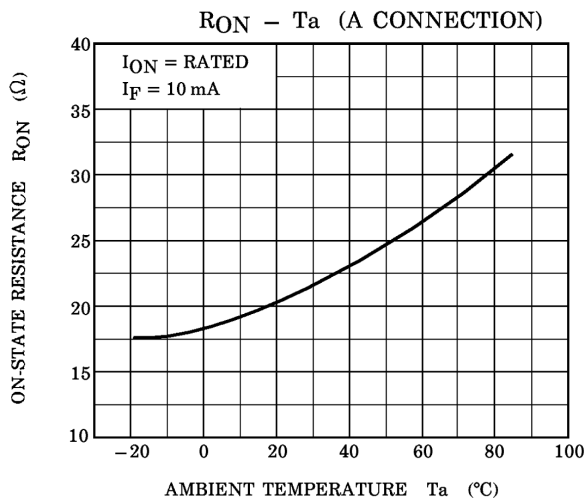
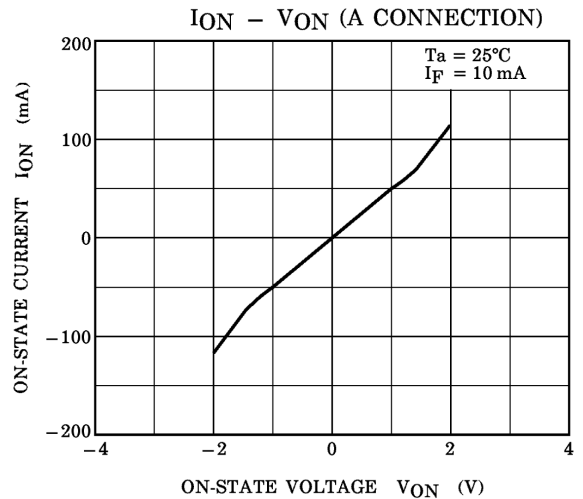
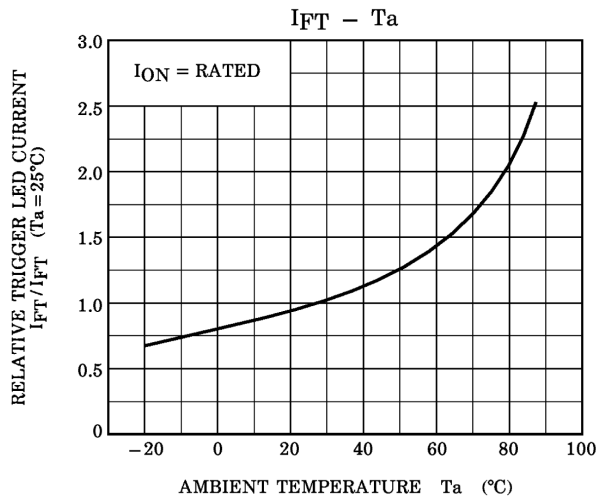
Switching Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Turn-on time	t_{ON}	$R_L = 200 \Omega$ $V_{DD} = 20 \text{ V}, I_F = 10 \text{ mA}$ (Note 1)	—	—	4	ms
Turn-off time	t_{OFF}		—	—	4	

(Note 1): Switching time test circuit







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